This homework is due on Thursday, November 20.

0. Read Sections 2.1, 2.2, and 5.6.1–5.6.2. After reading these sections, you should be able to answer the following questions (which are not to be turned in).

  • What is a population growth constant?
  • How are the limit laws for sequences related to the limit laws for functions?

1. Determine the population growth constant for each of the following population models:
   (a) \( N_t = 5e^{3e^{2t}} \)
   (b) \( N_t = 5e^{3t+e^{2t}} \)

2. Determine if the limits of the following sequences (or if the limit does not exist, explain why not).
   (a) \( a_n = (-2)^n \)
   (b) \( a_n = (-1/2)^n \)
   (c) \( a_n = e^{-n} \)
   (d) \( a_n = n \cdot e^{-n} \)
   (e) \( a_n = \cos(\pi n) \)
   (f) \( a_n = \sin(\pi n) \)
   (g) \( a_n = \frac{-n^3-2}{2n^2+6n-12} \)

3. Section 2.1 # 10, 16, 28, 56, 64

4. Section 2.2 # 30, 90, 98

5. Section 5.6 # 4, 6, 12, 14

6. (These problems are not to be turned in!)
   (a) Section 2.1 # 7, 13, 19, 25, 35, 43, 37
   (b) Section 2.2 # 11, 29, 31, 43, 51, 91, 97, 99, 101, 103, 105, 109
   (c) Section 5.6 # 1, 3, 7, 9, 13